

- MERIS L2 Processing

The MERIS L2 processing was modified to fix output of MERIS CLDICE/LAND flags to 'l2_flags' product. The MERIS L2 processing includes the addition of the Stumpf 412 iteration for correcting negative radiance values. The handling of the MER_FR__2P files was corrected.

- MERIS L1 Processing

The ability to process MERIS L1 has been installed. The Rayleigh tables have been uniquely generated for the MERIS sensor (Note: the 412 Rayleigh table contained some bogus data and replace with the OCM 414 Rayleigh table).

- QAA v5

The QAA algorithm has been updated to version 5. In this version, the 640 nm was been removed and replaced with the 670 nm channel.

- Field Spectrometer

The field spectrometer processing code was renamed from rrs_v2.0 to fldspec. The program now uses the relative spectral response functions from the l2gen program. It can produce OCM and MERIS convolved output files. The QAA output was updated to v5 of the algorithm.

- APS Plotting

The APS Plotting functionality was improved by correcting the plotting of log10 data on an axis, proper clipping of lines outside plot, and the addition of the star and triangle symbols.

- Sensor Merging

The sensor merging functionality was fixed to handle new file nomenclature and perform the 7-day latest pixel compositing.

APS v3.8.1 Release March 12th, 2009

- L2Gen updates

These updates include those produced by NASA/Goddard and include: The NIWA inherent-optical-properties algorithm, MODIS CIRRUS correction and detection, and updates to GIOP.

- SQL data base

The SQL data base tables were redesigned to improve data base integrity and the libraries were modified to reflect the table redesign; improve software maintainence; improve library integrity; handle MERIS L1/L2, HDF (TeraScan-based) OCM L1B files and HDF (TeraScan-based) AVHRR files; and update SeaWiFS L1A, MODIS L1 code which had fallen in disarray.

- New Versioning:

	APS v3.8	APS v3.8.1
AVHRR	v05	v05
MERIS	v03	v04
MODIS	v07	v08
OCM	v03	v04
SEAWIFS	v07	v08

Negative Input
Masked by NRL

QuickTime™ and a
BMP decompressor
are needed to see this picture.

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Flagged as:
Cloud by ESA
HILT by NRL

Cruise	SeaWiFS	MODIS/Aqua	MERIS L1	MERIS L2	Cruise	SeaWiFS	MODIS/Aqua	MERIS L1	MERIS L2
Dauphin Island	2				Horn Island	1	2		
SeaWiFS Verification	4				SEED	29	12	9	11
Tampa ECOHAB	8				RV/Ocolor 2005/dec	2		6	
Biloxi	1				EPA Bold 2006/sep	6	1		
NGLI 2001/apr	2				RV/Ocolor 2007/feb	6	6	5	
CoJet 3	30				EPA 2007/may		3	2	2
CoJet 4	3				EPA 2007/jul	3		2	1
NGLI 2001/sep	7				EPA Bold 2007/aug	3		3	3
CoJet 5	12				Dolche Vita		2		
CoJet 6	6				BioSpace 2008	10	17	7	6
CoJet 7	7		2		LEO 15/2001	22			

- Search In-situ Database

The in-situ data base was examined for possible match ups. A plot file used with imgBrowse was created for each day of the cruise.

- Search/Process SeaWiFS data

All satellite SeaWiFS data for each day was processed and images were examined to see which in-situ points looked good (not cloud cover or on edge). The list file and area scripts were added to the process_sat.sh processing script. The SeaWiFS data was added to rs/browse data base. If a scene had a clear match up pixel, it was added to rebuild-db.sh

- Add in-situ to database

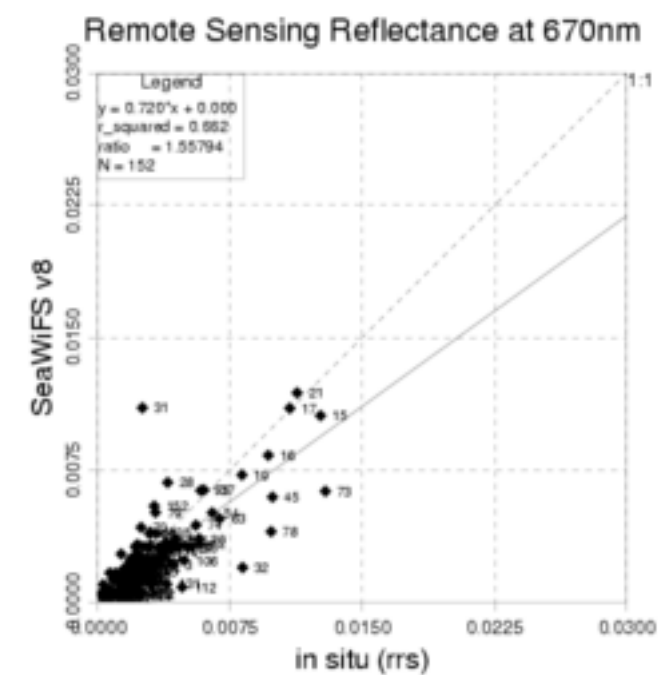
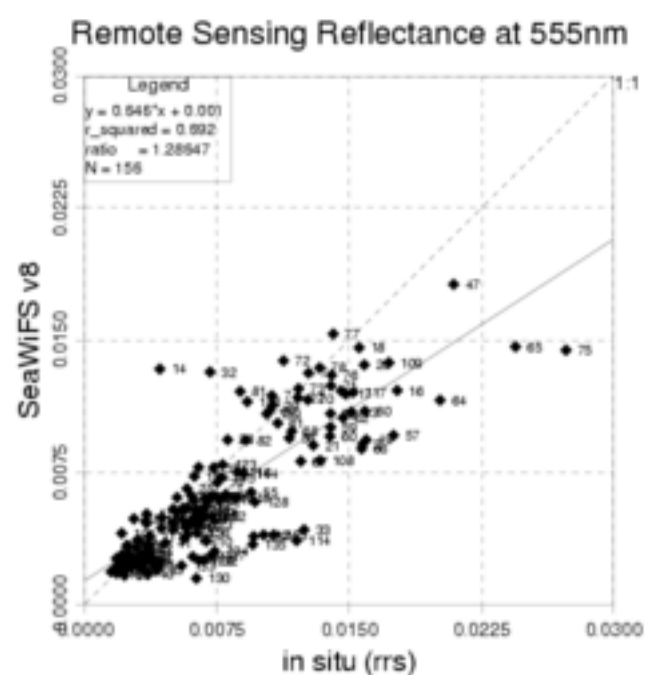
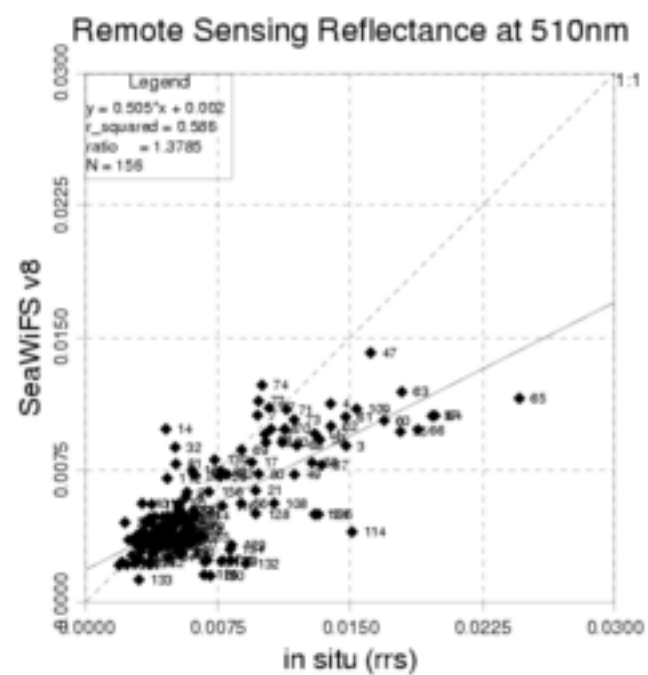
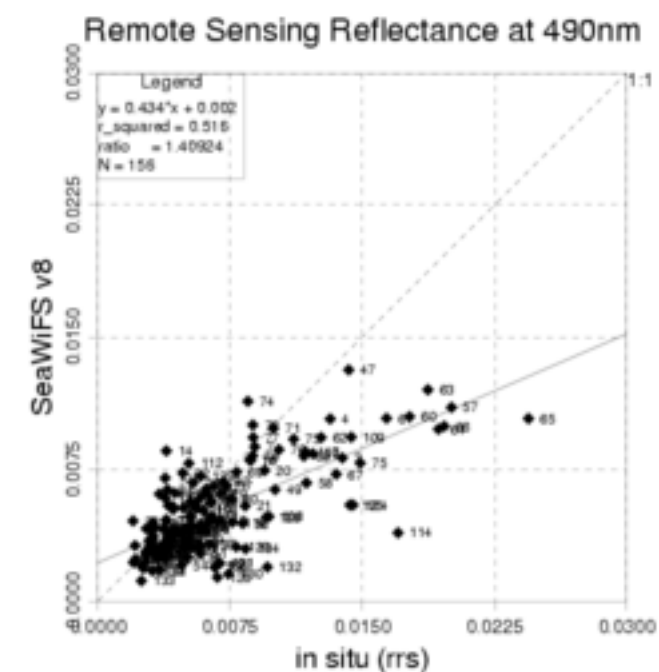
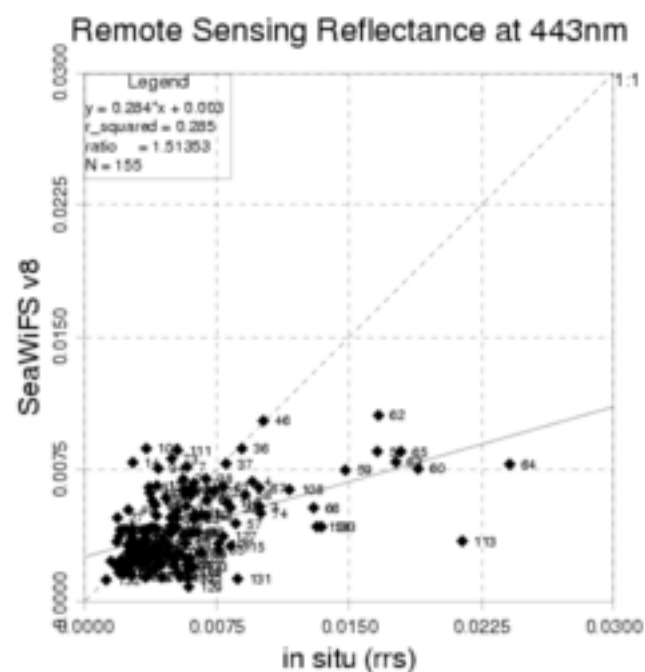
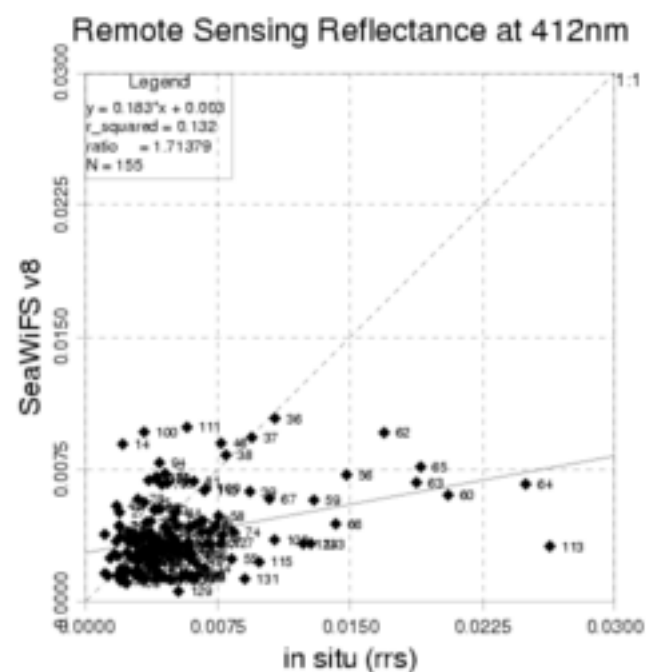
The in-situ data base was added to the in-situ data base and the rebuild-insitu.sh script.

- Generate Matchup

The rebuild-insitu.sh, rebuild-db.sh were run to update SQL database and then run_matchup was run to update results.

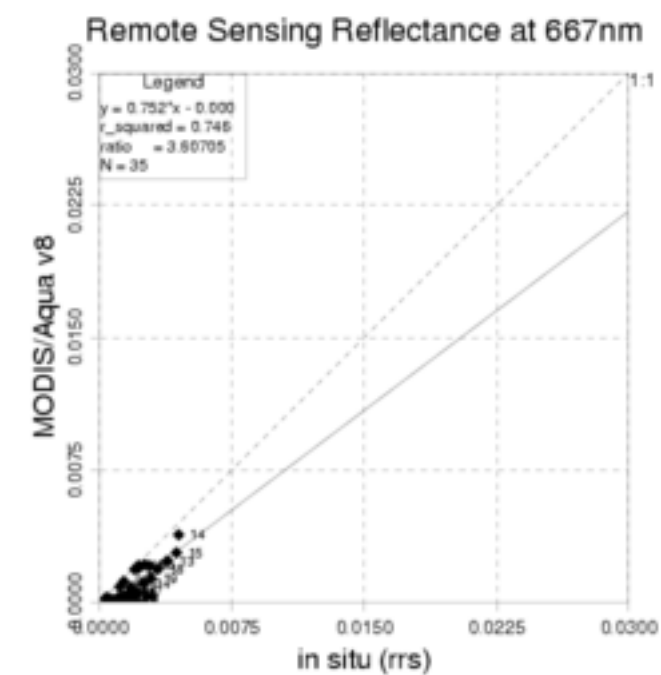
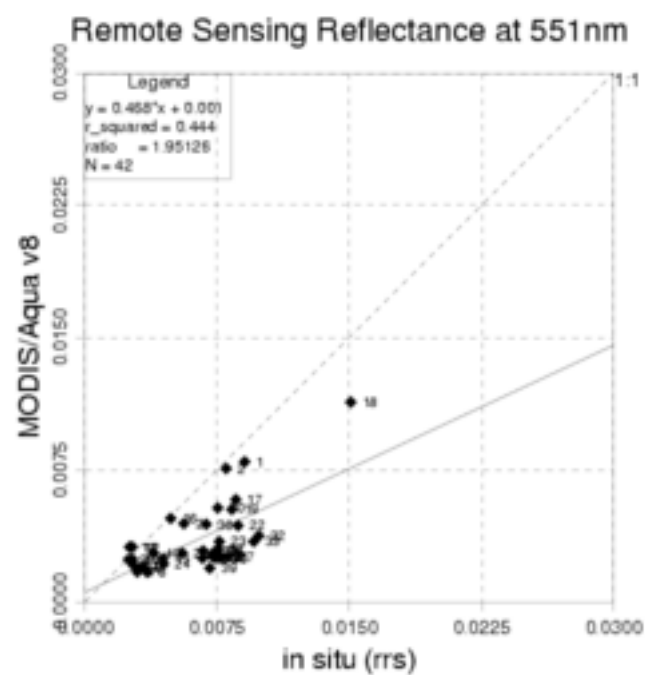
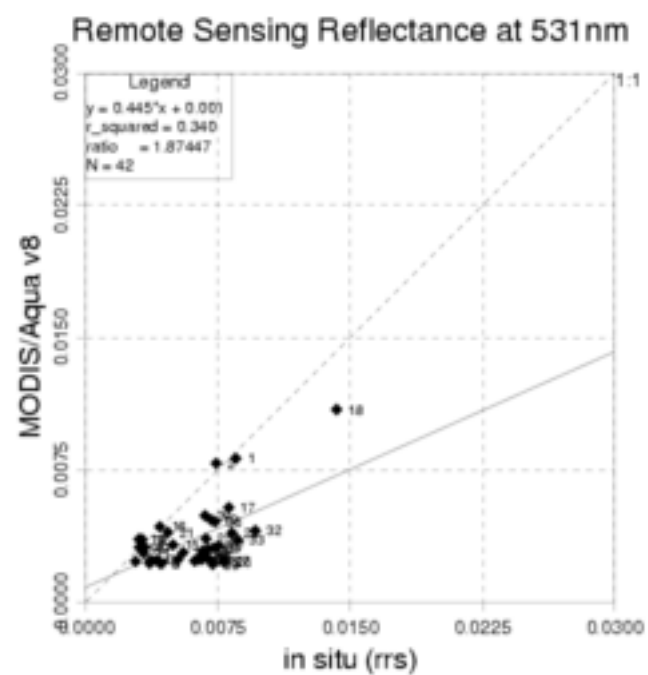
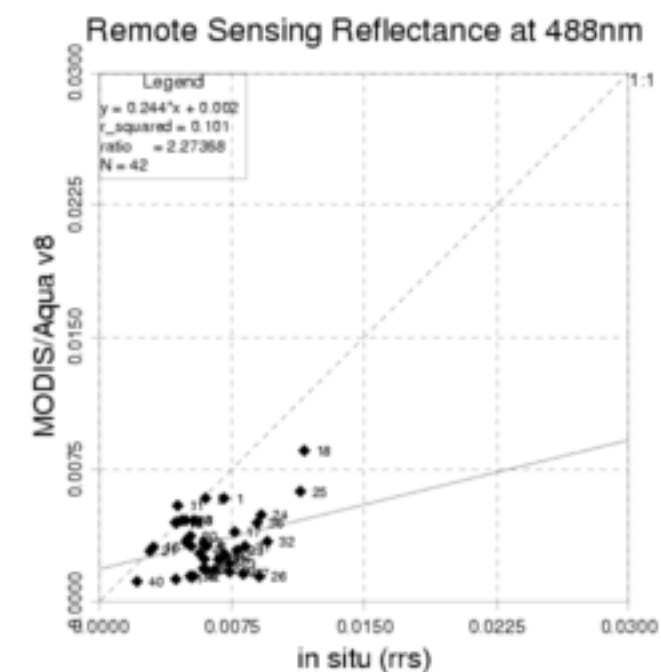
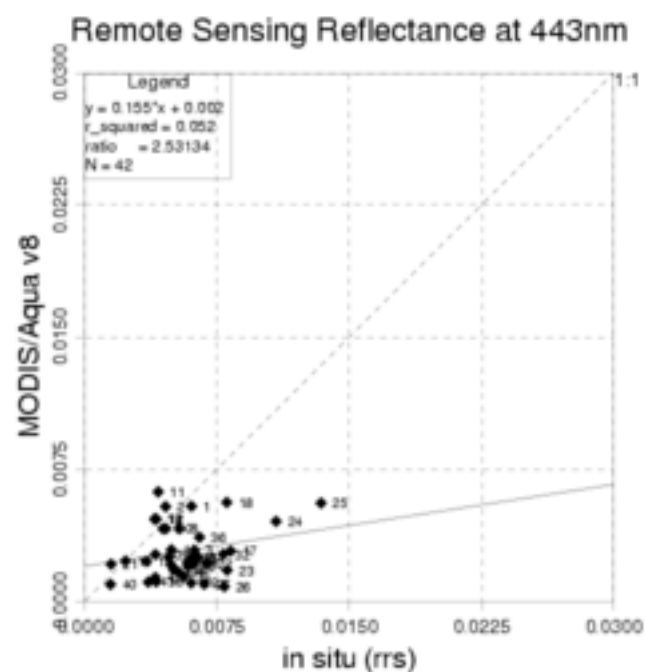
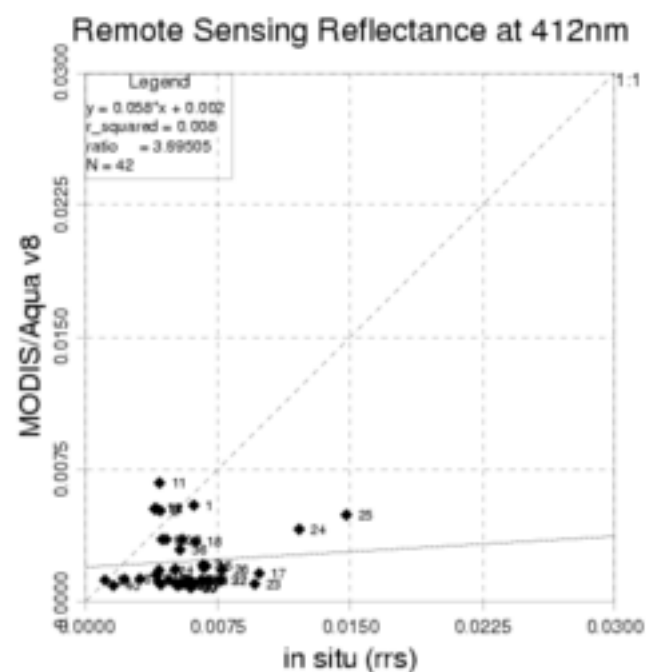
- Search In-situ Database
Each directory in /projects/insitu was examined for SIMBIOS data files that would be used for matchup. Over 40 possible cruise dates were examined of which 22 had data match ups. Over 500 SIMBIOS data files were examined.
- Reprocess in-situ data
Several in-situ ASD cruises were reprocessed since the cruise had not be processed with latest fldspec software (no SIMBIOS file).
- Verification/Correction of in-situ data
The in-situ data was examined to make sure date/time was correct. In several occasions the times were not correct (local vs GMT).
- Generate Matchup Database
All valid/matching data was copied to a new data base under matchup tree (matchup/data/insitu).

- 80 SeaWiFS L1A files were used in 8 regions.
The L1A files were the “Merged-LAC” data set as generated by NASA. These data sets merge all LAC and HRPT data to provide the cleanest data set (i.e., not bit errors, dropped lines, etc.)
- Calibration
Calibration file SEAWIFS_SENSOR_CAL.TBL-200707 and the corresponding vicarious calibrations as generated by NASA.
- Atmospheric Correction
Each L1A was processed using the standard NRL processing scheme which includes using the Gordon 7/8 atmospheric correction with the NIR iteration. This is followed by the Stumpf 412 iteration.
- Processing Notes:
A few stations were visually examined and adjustments to the cloud detection threshold were made to allow data to pass through.



- 155 match ups
- 10 Years of SeaWiFS
The match ups for SeaWiFS are by far the most numerous due to the longevity of the sensor's life span.
- Blue Bands
The blue bands showed the greatest inconsistency. This shows that the data still has problems with atmospheric correction and estimation in the coastal waters.
- Green/Red Bands
The atmospheric correction is fairly stable with respect to the green and red bands.

- 40 MODIS L1B files were used in 5 regions.
The MODIS L1B files were obtained from the NASA Land/Atmosphere Archive and Distribution System.
- Calibration
Calibration was provided by MODAPS and varied by file; The corresponding vicarious calibrations as generated by NASA.
- Atmospheric Correction
Each L1A was processed using the standard NRL processing scheme which includes using the Gordon 7/8 atmospheric correction with the NIR iteration. This is followed by the Stumpf 412 iteration.
- Processing Notes:
A few stations were visually examined and adjustments to the cloud detection threshold were made to allow data to pass through.



- 42 match ups

- Blue Bands

The blue bands showed the greatest inconsistency. This shows that the data still has problems with atmospheric correction and estimation in the coastal waters.

- Green/Red Bands

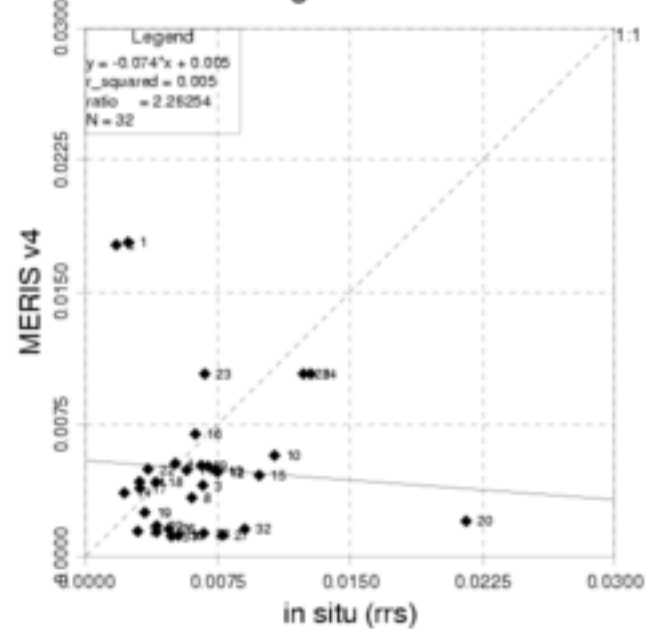
The atmospheric correction is fairly stable with respect to the green and red bands. However, the data is not as close to the 1:1 as would like.

- Calibration

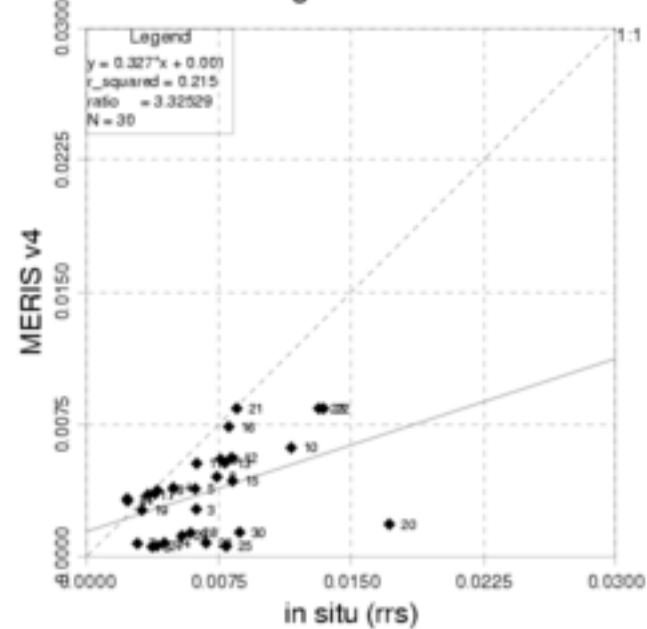
The lower 1:1 ratio might be due to the inconsistency in the L1B calibration and the application of the vicarious gain.

- 13 MERIS Reduce-Resolution L1 files were used in 5 regions. The L1A files were the Reduced-Resolution Level-1 data set as generated by ESA. The ESA global archive was used to obtain the data sets used.
- Calibration
Calibration was provided by ESA and varied by file; There was no vicarious calibration performed.
- Atmospheric Correction
Each L1A was processed using the standard NRL processing scheme which includes using the Gordon 7/8 atmospheric correction with the NIR iteration. This is followed by the Stumpf 412 iteration.
- Processing Notes:
The Rayleigh/aerosol tables were generated by NASA for the MERIS bands (camera 3) and used through out the images. The 412 Rayleigh table corresponded to the SeaWiFS channel since the original file contained erroneous data.

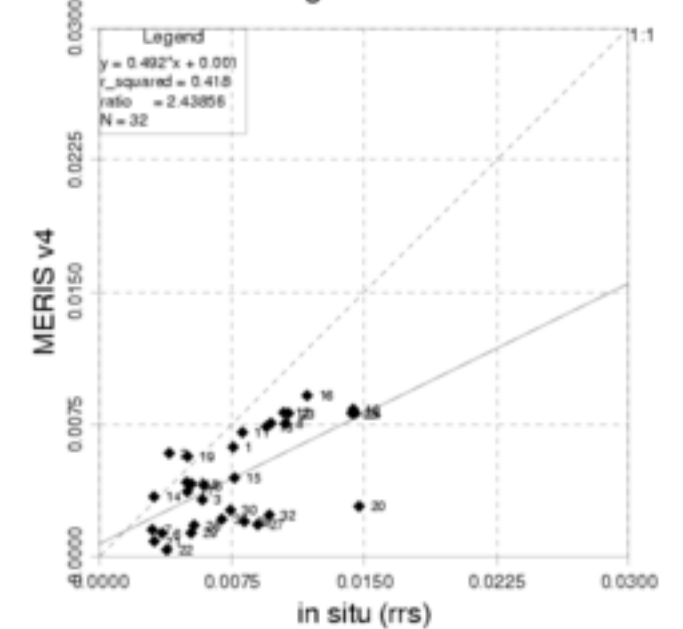
Remote Sensing Reflectance at 412nm



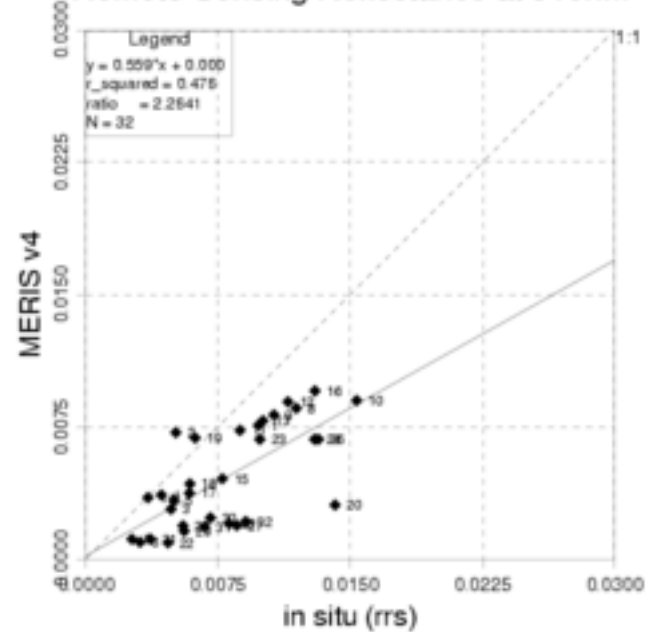
Remote Sensing Reflectance at 443nm



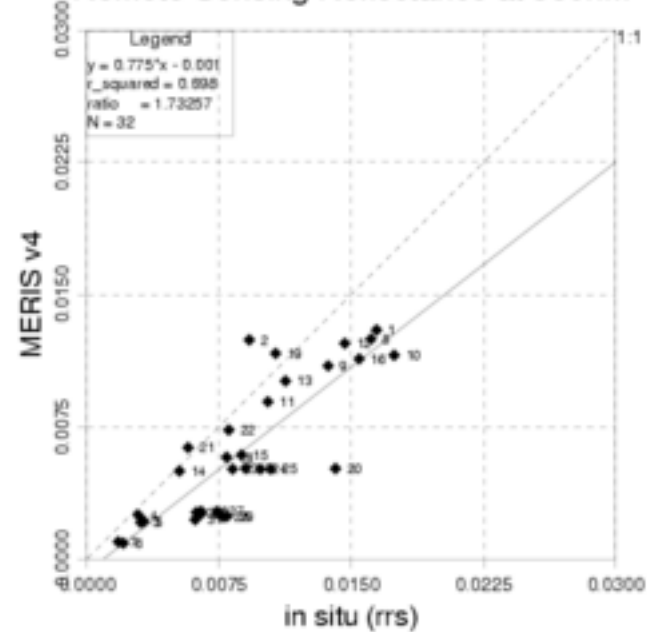
Remote Sensing Reflectance at 490nm



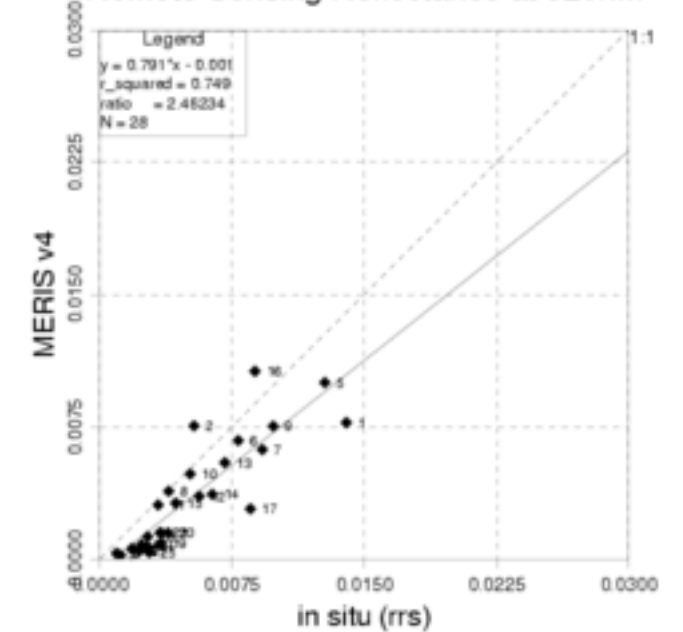
Remote Sensing Reflectance at 510nm



Remote Sensing Reflectance at 560nm

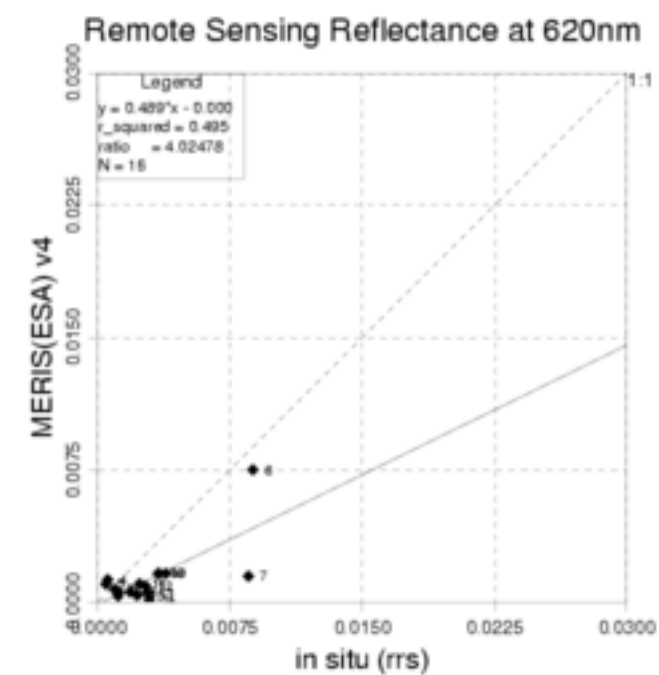
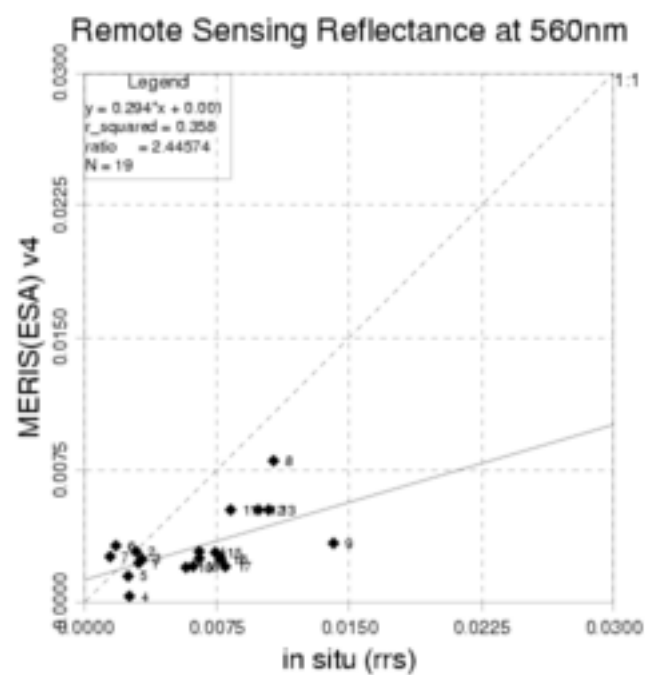
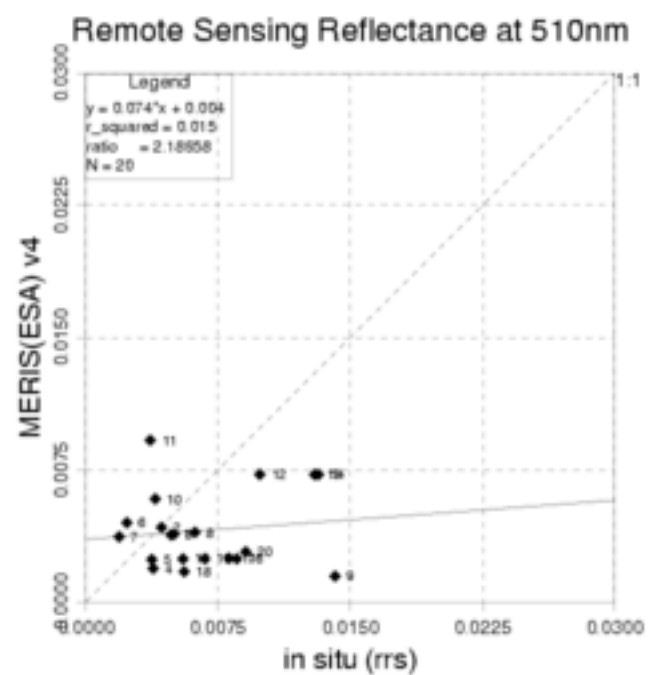
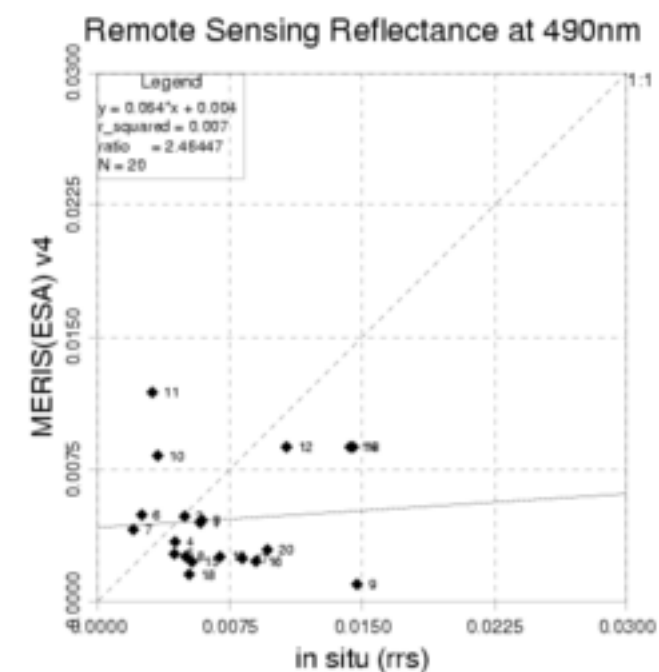
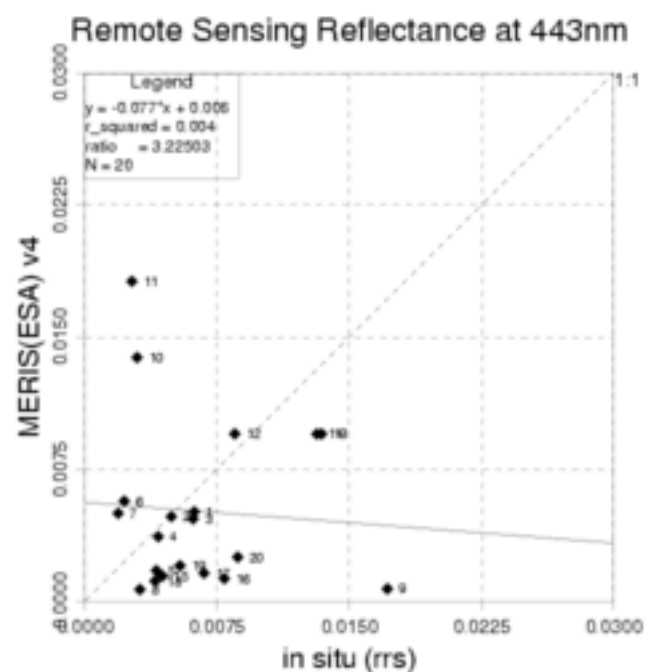
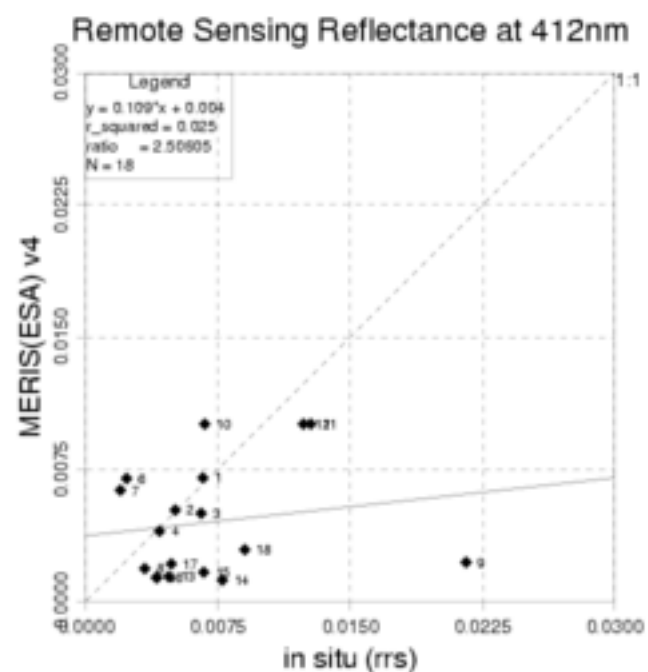


Remote Sensing Reflectance at 620nm



- 32 total match ups
- Blue Bands
The blue bands showed the greatest inconsistency. This shows that the data still has problems with atmospheric correction and estimation in the coastal waters.
- Green/Red Bands
The atmospheric correction is fairly stable with respect to the green and red bands.
- 412 Band
The 412 band is using a Rayleigh table that was designed for SeaWiFS. This might explain the greater scattering in the 412.

- 13 MERIS Reduce-Resolution L1 files were used in 5 regions. The L1A files were the Reduced-Resolution Level-2 data set as generated by ESA. The ESA global archive was used to obtain the data sets used.
- Calibration
Calibration was provided by ESA and varied by file; There was no vicarious calibration performed.
- Atmospheric Correction
Each L1A was processed by ESA using their atmospheric correction.
- Processing Notes:
The MERIS L2 data is divided into several classes “water”, “land”, and “clouds”. The MERIS L2 data provides data flags to determine pixel status information.



- 18 total match ups
- Blue Bands
The blue bands showed the greatest inconsistency. This shows that the data still has problems with atmospheric correction and estimation in the coastal waters.
- Green/Red Bands
The atmospheric correction is fairly stable with respect to the green and red bands.
- Processing Notes:
A few stations were visually examined and adjustments to the cloud detection threshold were made to allow data to pass through.

Future Work

- New in-situ data sets
There were some recent cruise work (2009) that was not part of this present matchup.
- In-situ data processing
Some cruise data has not be processed using the latest version of the field spectrometer processor (no SIMBIOS files).
- In-situ data re-processing
The raw in-situ data will be reprocessed using the latest version of the field spectrometer data set to insure consistency the new in-situ data base.
- SeaBASS data sets
There are some SeaBASS data sets that were.

Future Work

- MODIS L1A
To remove the inconsistencies of the MODIS calibration, the MODIS L1A data will be processed and calibrated by NRL.
- MERIS L1A
To remove the inconsistency of the five camera, the MERIS Smile Correction will be applied.
- MERIS L1A
New Rayleigh/aerosol tables will be used to improve the MERIS L1A processing consistency. This is especially important for the 412 Rayleigh table.
- OCM
With the addition of new cruise data it is hoped that some data match ups for OCM can be found.